

RESERVE COPY PATENT SPECIFICATION

352,003

Application Date: Jan. 2, 1930. No. 184/30.

Complete Accepted: July 2, 1931.

COMPLETE SPECIFICATION.



Improvements in Printing Presses.

I, ROBERT RUTHERFORD McCORMICK, Publisher, of Tribune Square, 435, North Michigan Avenue, Chicago, State of Illinois, United States of America, a citizen of the United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to printing devices whether of the single or multiple color type and whether impressing by cameo or intaglio surfaces or spaces, the term printing being merely used in the generic sense to include impressions upon webs, of any kind in the printing art.

It has been proposed heretofore to combine several web printing units and folders, whereby one of the folders was capable of moving above the press into operative relationship with different printing units.

According to the present invention I provide a printing press with a number of units and movable folding means for receiving the web acted on by the units, characterised by the fact that the web folding means are movable alongside the press for selectively receiving the web acted upon from any selected unit of the press.

The invention also preferably comprises the feature of handling and operating upon a number of webs simultaneously, such as side by side webs, and also the provision of a turning means or device with a number of turning reversing and guiding bars, rolls and the like in courses or decks so that the webs, or slitted sections thereof, may be received, operated upon and led from these courses selectively, the folder likewise being also designed for receiving the webs either side by side or one above the other as in parallel planes or both.

In the accompanying drawings illustrating an embodiment of the invention, Fig. 1 is a side view in elevation and diagrammatically of a portion of a printing press constructed in accordance with the invention.

[Price 1/-]

Fig. 2 is an end view thereof.

Fig. 3 is a top plan view thereof.

Fig. 4 is a fragmentary side view showing driving connections for the adjustable devices, with part of the press in dotted lines.

Fig. 5 is a front view in elevation and partly diagrammatic, of the folding mechanism and the driving connection thereto.

Fig. 6 is a side view in elevation of the guiding and turning device.

Fig. 7 is a fragmentary end view of the same.

Fig. 8 is a side view of the guiding and slitting device.

Fig. 9 is a fragmentary view of the same and showing the driving mechanism for the device.

Fig. 10 is a fragmentary view of the parts shown in Fig. 9 showing different positions of the driving members.

Fig. 11 is a similar view to Fig. 10 with the parts in another position of driving.

Fig. 12 is a view in end elevation of part of the driving connection to the guiding and turning device and also showing the means for lifting and lowering the device.

Fig. 13 is a transverse sectional view taken in a plane represented by line 13—13 in Fig. 14 of the drawings.

Fig. 14 is a side view of the means for lifting and lowering the device.

Figs. 15, 16, 17 and 18 are diagrammatic and schematic showings of the various arrangements possible with the turning bars and the reversing rolls or bars, and the direction of travel of the webs.

And Fig. 19 is a plan view similar to Fig. 3 but on a smaller scale and extended to show a plurality of folders and motors disposed along the row of printing units making up the unit type press now commercially used in large newspaper establishments.

Referring now more in detail to the drawings, the embodiment selected to illustrate the invention is shown as comprising a series or row of printing units 1, 2, 3, 4, 5, 6, 7, 8 and 9 arranged in spaced relation and parallel to each other,

BEST AVAILABLE COPY

and in an indefinite number. Each unit may comprise a printing roll 10, an impression roll 11 and suitable ink carrying mechanism of any suitable type, and a drying drum 12 as well as suitable guiding bars usually pertaining to such units.

These units preferably are included in a press frame having lower supporting longitudinals or girders 13, base frame portions or girders 14, upright side frame portions 15 and 16, horizontal reinforcing portions 17 and upper longitudinal portions 18 and 19, the latter portions constituting a track for some of the movable devices, more fully hereinafter described.

The press as a whole may be suitably supported upon pillars 20 and 21 and the like, as clearly shown in Fig. 2 of the drawings.

At one side of the row, or rather in front of the units, is disposed a longitudinal track comprising track members 22 and 23 supported upon girders 24 and 25 and pillars 26 and 27 and the like.

The girders 13 of the press may be reinforced by cross members 28, and the base members 14 may likewise be reinforced by cross members 29. Parallel to and extending along the rear base member 14 is supported a driving shaft 30 rotatably supported in a number of bearing carrying brackets 31 secured to the side of the member 14. The shaft 30 has splined at intervals thereon pairs of bevel gears 32 and 33 connected with grooved hubs 34, Fig. 4, adapted for shifting by a suitable yoke mechanism, each pair of gears being provided, preferably, in correspondence with each unit in the press. These gears are adapted for enmeshment alternately with a bevel gear 35 fixed to the lower end of a vertical shaft 36 having bearings 37 and 38, Fig. 2, suitably carried by the upright frame portion 16, the upper end of the shaft 36 having fixed thereto a coupling member 39, shown more in detail in Fig. 12 of the drawings. When the gears 32 and 33 are shifted in one position, such as that shown in Fig. 4 of the drawings, the shaft 30 will drive the shaft 36 in one direction of rotation, and when the gears are shifted in an opposite direction, so that the gear 32 will mesh with the gear 35, the shaft 36 will be rotated in a reverse direction of rotation. It will be observed from Fig. 4 of the drawings that there are a plurality of vertical shafts 36, each driven in the same manner from the shaft 30, and arranged preferably with a shaft 36 for each printing unit and so located that the coupling member 39 may be selectively engaged with a similar member of one of the movable devices adjusted or moved

along the track 18-19, more fully explained below.

Within the frame member or girder 23 is longitudinally disposed a shaft 40 rotatably supported in bearing carrying brackets 41, Fig. 3, secured to the girder 23, as clearly shown in Fig. 3 of the drawings. Shaft 40 carries a plurality of spaced bevel gears 42 secured to the shaft in any suitable manner, as by keys or the like, these gears being provided at intervals, for the selective enmeshment therewith of a bevel gear 43, Fig. 5, carried by the lower end of a shaft 44 rotatably supported in bearings 45 and 46 forming rigid parts of a frame 47 of a folding device or mechanism, the latter being capable of traveling longitudinally along and over the tracks 22 and 23 and along the side of the row or press. The gear 43 is preferably splined or similarly secured to the shaft 44 so as to be able to be raised upwardly to clear the teeth of the gear whenever the folding mechanism is moved along the track 43 from one position to another, the gear 43 being held in raised position in any suitable manner, as by a set-screw or the like and then lowered again to enmeshing position with the selected gear 42 and secured in position by the set-screw or the like. The folding mechanism is movable over the tracks 22 and 23 to any one of several positions in correspondence with the gears 42 and corresponding units of the press.

The shaft 40 may be driven by way of a gear 48 secured thereto in suitable manner, and a gear 48' enmeshed therewith and secured to a cross shaft 49 carrying a gear 50 driven by a gear 51 connected to a shaft 52 rotatably supported in brackets 53 secured to the side of the girder or base frame portion 14 as clearly shown in Fig. 3 of the drawings. The shaft 52 may be driven by means of a belt or train of gears 54 from a motor 55, and this shaft may carry a gear 56 for driving the shaft 30 through a gear 57 secured thereto and provided with suitable shifting and clutching mechanism for the clutching in and out of this shaft.

The folding mechanism comprises a frame 47 carrying suitable means including draw rolls 58 driven from shaft 44 for drawing the webs in folded condition, from the folding aprons 59, as is usual in devices of this kind. The upper part of the frame has an upwardly extending portion 60 carrying a set of guide rolls 61 and having laterally extending feet 62 and 63 adapted to slide along and engage with the longitudinally extending track portion 18 and part of the frame of the turning mechanism to be described hereinafter more fully, suitable securing means

being used if desired for holding the feet in selected position.

The guiding and turning mechanism comprises a rigid frame having corner posts or uprights 64, 65, 66 and 67, the lower ends of which are adapted to rest upon the track members 18—19 as will be later more fully described in connection with Figs. 12, 13 and 14 of the drawings.

The corner posts are suitably connected by horizontal reinforcing frame members and also carry together with the connecting frame members, supporting brackets 68, 69, 70, 71, 72, 73, 74, 75, 76, and 77 for turning or angle bars 78, 79, 80, 81 and 82, it being understood that there is any desired number of these bars and supporting brackets therefor and arranged in different parallel and horizontal planes or courses or decks. The supports are arranged in such a position that the angle bars may be supported thereon in different arrangements and combinations as most clearly shown in Figs. 15, 16, 17 and 18 and more fully described hereinafter. The ends of the bars may be perforated to receive upwardly extending lugs of the supporting brackets and held or secured in place by suitable securing means, such as nuts threaded upon the ends of the studs.

At the ends of the frame are provided guiding bars or rollers 82^a and 82^b suitably supported by brackets 82^c and 82^d rigid with the corner posts of the frame and arranged for the convenient guiding of the webs or web sections to the turning bars and reversing rolls carried by the frame.

At one side of the turning bar mechanism frame and at the ends thereof, may be provided suitable brackets 83, 84 and 85 for carrying reversing rollers or bars 86, 87, and 88, these being arranged in different courses or decks in correspondence with the courses or decks of the turning bars in the frame of the mechanism.

At the lower end of each corner post or upright is provided a foot 89 having a laterally extending and depending toe 90 adapted to be guided against the inner side 91 of the track member 18 or 19, as clearly shown in Fig. 12 of the drawings. Also, secured to one side of the lower part of each post is a bearing carrying bracket 92 having bearing portions 93 and 94 carrying, rotatably, a shaft 95, to one end of which is secured an arm or crank 96 as clearly shown in Figs. 12, 13 and 14 of the drawings. An intermediate portion 97 of the shaft 95 is in the form of an eccentric or the like and forms a journal or bearing for a roller or wheel 98 adapted to engage with or roll along the

top surface 99 of the track member 18 or 19 as the case may be. The bracket 92 may be provided with a stud or pin 100 for receiving a slotted portion 101 forming an integral part of the arm 96, the stud 100 being preferably threaded to receive a tightening nut 102 adapted to secure the arm 96 in position with the part 101 in engagement with the stud 100 when the arm 96 is in raised position, as shown in Fig. 4 of the drawings. It will be observed that when the arm 96 is in raised position, the portion 97 is in lowered position so that the roller 98 is lowered relative to the foot 89 and connected parts, or, in other words, the ends of the shaft 95 are raised, thus also raising the corner posts and the mechanism carried thereby. This will effect the raising of the feet 89 a slight distance above the track surface 99. The turning mechanism, as a unit, then may be moved with facility along the track, the rollers 98 rolling upon and along the track members 18 and 19. The guiding toes 90 will prevent the lateral shifting of the mechanism relative to the track.

When the mechanism has been moved to the desired or selected point or station, the mechanism may then be set down upon the track. This is effected by loosening the nut 102 to permit the disengagement of the handle 96 from the stud 100, and by lowering the handle 96 to shift the cam 97 for raising the roller 98, that is, for permitting the lowering of the mechanism with the feet 99 until the latter come to rest upon the track surfaces 99, the mechanism thus being held in stationary position by its own weight, or, if desired, suitable securing means may be used to hold the device in place. A further slight movement of the arm 96 and cam 97 will effect a slight raising of the roller 98 to relieve it of any load or weight.

To one of the corner posts, such as the corner post designated by the reference character 65 in Fig. 12 of the drawings, is also secured a laterally extending bracket 103 carrying a bearing 104 in which is rotatably supported a vertical shaft 105 having at its lower end a coupling member 106 adapted to be coupled to any one of the coupling members 39, over which the coupling member 106 may be brought into position when the mechanism is moved to selected position. The coupling member 106 has a hub 107 slidable with reference to the shaft 105 or splined thereto and may also carry suitable securing means, such as a set-screw 108. When the coupling member 106 is in mesh with the member 39, a space is provided between the upper end of the hub 107 and the

lower end of the bearing 104, and in this space is placed a spacing collar 109 formed of hinged semi-annular portions, and having a locking bolt 110. When it is desired to move the turning mechanism, the collar 109 may be loosened or removed, and the set-screw 108 also loosened, when the coupling member 106 may be raised to the position shown in Fig. 12 of the drawings, that is clear of the coupling member 39. The set-screw 108 may then be secured in place for holding the coupling member 106 in raised position, and the collar 109 may be left loosely about the hub 107 or clamped thereto as shown in Fig. 12 of the drawings. The turning mechanism may then be caused to travel along the track to any desired station and with the coupling member 106 located above the particular coupling member 39 of that station. The set-screw 108 may then be loosened to permit the coupling member 106 to descend and become meshed with the coupling member 39 and the set-screw 108 again tightened, and the collar 109 tightened in the space between the hub 107 and the bearing 104.

Referring now to Figs. 6 and 7 of the drawings, the shaft 105 extends upwardly and is provided with a pair of bevel gears 111 and 112 connected by a shifting grooved hub 113 suitably splined to the shaft 105, whereby the gears 111 or 112 may be alternatively engaged with a bevel gear 114 secured to a shaft carrying a driving gear 115 in driving engagement with gears 116 and 117 fixed to the ends of rollers 118 and 119 having suitable bearings in the side members or corner posts of the turning mechanism, the shaft for the gear 115 also having a suitable bearing 120 rigid with a part of the frame of the turning mechanism. The rolls 118 and 119 serve for feeding the web through the mechanism or for drawing the same from a guiding and slitting mechanism to be described hereinafter.

For the purpose of driving a set of similar rolls on the opposite side of the mechanism, gear 115 drives a gear 121 adapted to drive through bevel gears 122 and 123 and a shaft 124 having bearings 125 and 126 carried by rigid parts of the mechanism, and driving through gears 127 and 128 to a vertical shaft 129 supported in bearings 130 carried by the frame of the mechanism. The shaft 129 drives through gears 131 and 132 to the rolls on the opposite side of the frame from the rolls 118 and 119.

Heretofore slitting and guiding means were provided on the same structure as included the turning bars, but in this invention, the slitting mechanism is

independently provided, and as shown in Fig. 1 of the drawings, comprises a frame 133 having rigidly attached brackets 134 carrying rollers 135 and operating handles 136 of the same construction as that shown in Figs. 12, 13 and 14 of the drawings and described above in connection with the turning mechanism for lifting and moving the mechanism and for setting the same down again upon the tracks 18-19. Any number of these slitting devices may be moved along the track to any desired point, and if desired, on both sides of the turning mechanism, as shown in Fig. 1 of the drawings, and at stations or points for connection with a vertical driving shaft 36 at the particular station where the slitting mechanism may be located.

For the purpose of driving the slitting mechanism, the frame 133 carries bearings 137 and 138, Figs. 8, 9, at one side thereof, for rotatably supporting a shaft 139 to the lower end of which is secured a coupling member 140 adapted for vertical movement and adjustment by the same means for moving and adjusting the coupling member 106 of the structure shown in Fig. 12 of the drawings. The upper end of the shaft 139 has secured to it a driving bevel gear 142 in mesh with a bevel pinion 143 rotatably supported upon a stud secured to the frame 133, and driving a spur gear 144. About the spur gear 144 are provided two gears 145 and 146 of which the former is slidable upon an extension 147 of shaft 148 carrying a grooved roller 149 with the grooves of which cooperate the slitting cutters 150, the latter being carried by shaft 151 supported at the end of arms 152 rotatably supported in brackets 153 forming a rigid portion of the frame 133. The gear 145 is preferably splined to the shaft section 147 and is movable into and out of mesh with the gear 144 as clearly shown in Figs. 9, 10 and 11 of the drawings. The gear 146 is of greater width than the gears 144 and 145, and sufficiently for driving from the gear 144 through the gear 146 to the gear 145, as clearly shown in Fig. 11 of the drawings. Gear 146 is loosely rotated and slidable upon a stud secured to the frame 133 by means of a nut 155 or the like. For the purpose of driving the roller 149 in one direction, the gear 144 may drive directly through the gear 145, in which case the gear 145 shall have been shifted to mesh with the gear 144 and as shown in Fig. 10 of the drawings. In the event of driving the roller 149 in a reverse direction, the gear 144 drives through the intermediate gear 146 which in turn drives the gear 145. The gears will be in the position shown in Fig. 11 of the drawings, where the

gear 146 is moved into mesh with the gear 144 and the gear 145 is out of mesh with the gear 144 but is in mesh with the gear 146.

5 When it is desired to disconnect the driving mechanism with the roller 149, both gears 145 and 146 may be moved out of meshing position with the gear 144 and in the position shown in Fig. 9 of the drawings.

10 The frame 133 may also be provided with brackets 156 carrying rotatable guide rollers 157 and 158 so located that when the web is slitted in two or more side by side sections, one of the web sections may pass under one of the guide rolls, such as the roll 157, and the other section may pass over the roll 158 to respectively upper and lower courses or decks of the turning bars in the turning mechanism.

The web or webs may be supplied from reels 160, 161, 162, 163, preferably in the space beneath the press or upon a sub-floor, and for the purpose of illustration, a web may be led from a roll 164 as aided by suitable web feeding means 165, and pass over guides or rolls 166, 167, 168, 169 and thence to the printing and impression cylinders 10 and 11 of the unit 5. The web may then pass over guides 170 and 171 to a drying drum 172 and thence over guides 173 and 174 to the printing and impression cylinders 10 and 11 of the unit 4 and thence over a guide 175 to a drying drum 176, the printing in the unit 4 being for the purpose of making impressions upon the reverse side of the web. The web then proceeds from the drying drum 176 by way of guides 177, 178, 179, 180 and 181 and may then travel directly upwardly into the turning mechanism, as shown in Fig. 1 of the drawings, or proceed over guides 182 and 183 into the printing and impressing cylinders 10 and 11 for the unit 3 and thence over guide 184 to drying drum 185 and thence over guides 186, 187, 188, 189 and 190 to the guiding and slitting mechanism, the web passing over the slitting roll 149 and the slitting disks 150 cooperating with the grooves in the roll for slitting the web into two or more side sections. One section may pass under the roll 157 and into an upper part of the turning mechanism and the other web may pass over the roll 158 and feed into a lower part of the turning mechanism. From the above it will be seen that a web may pass through two or three units of the printing press to the turning mechanism. If desired, the web may pass through a larger or fewer number of units depending upon the number of operations to be produced or perfected upon the web.

As another example, a web may be feeding from another roll 191 under the action of an endless feeder 192 and passing over guides 193, 194, 195 and 196 to printing and impression rolls or cylinders 10 and 11 of the unit 7, and thence over guide 197 to a drying drum 198 and thence over guides 199 and 200 to printing and impressing cylinders 10 and 11 of unit 6, and again proceeding over guides 201, 202, 203, 204 and 205 into the turning mechanism directly, without going through a slitting mechanism. If desired, the web may pass from the guide 204 or 205 to the slitting mechanism shown at the right hand side of the turning mechanism in Fig. 1 of the drawings, and thence from the same to the turning mechanism.

While the course of only two of the webs has been illustrated in two different ways, it is to be understood that other webs may proceed from other reels end to end through one or more printing units in any selected number and in any selected combination to one or more particular slitting devices and to one or more turning devices and folding devices as the page and section arrangement of the paper may require.

For the purpose of disclosing the various uses to which the turning device may be put, reference will now be made to Figs. 15, 16, 17, and 18 which show in a more or less schematic and diagrammatic way the various arrangements of the turning bars and the various ways of threading or leading the webs therethrough with definite purposes.

In the arrangement shown in Fig. 15, the turning bars are arranged with bar 211 in an upper course and 210 and 212 in a lower course, the bar 211 being long and extending from corner to corner of the frame, while the bars 210 and 213 are of shorter length. These bars, in this arrangement, are adapted to turn the web sections proceeding from a slitting arrangement, such that one section may proceed in the direction of the arrow-line 214 and after turning upon the bar 210, proceeding to the folder as indicated by the arrow-line. At the same time the other section may proceed in a path shown by the arrow-line 215 so that the section, last mentioned, may proceed to the folder in a plane parallel to that shown by the arrow-line 214, or this section may follow the path of the arrow-line 216 for turning on the bar 213 and proceeding to the folder in side-by-side relation with the first section following the arrow line 214. The first section, instead of following the line 14 may be led through the turning 130

device in a path represented by the arrow line 217 and turned upon the bar 212 and proceed to the folder in parallel relation with the web proceeding in the direction of the line 216. This is an illustration of turning the webs without the use of the reversing bars or rolls 86, 86', 87 and 87'.

In Fig. 16 is shown another arrangement of bars where the web sections may be reversed about reversing rods, such as rods or rolls 86', 87 and 87' as well as being turned about the turning bars to proceed in different relations to the folder. As for example, a web section may proceed to the turning bar 210 and 212 respectively along the paths of arrow-lines 214 or 217 as heretofore. The other section may proceed along the path 219 to a turning bar 218 and thence away from the folders to the reversing bar 87' and return by way of the path 220 to the folder and in a plane parallel to the section of the path 217. As an alternative, the other section may proceed along the path 221 through the turning device and therefore past the folders directly to the reversing roll or bar 86' and returning to the turning bar 222 and then proceeding along path 223 to the folder in side-by-side relation with the web of path 217 or in parallel relation with the web of path 214. Similarly the section may follow the path 224 to turning bar 222 and away from the folders to the reversing bar 87 and returning by path 225 directly to the folder. The above is an example of an arrangement where the web section proceeding through an upper course may be reversed in different ways, and made to proceed either in side by side relation or in different parallel planes with reference to the web passing through a lower course in the turning device.

In Fig. 17 is another arrangement whereby the web sections may be reversed in upper and lower courses, as for example one of the webs may proceed along the path 226 past the folders 226 to the reversing bar 86 and back to turning bar 227 and proceed by path 228 to the folder, or the same web may proceed by a path 226 past the folders to the reversing rolls 86 and return to the turning bar 229 and proceed along path 230 to the folding device. In another course, such as an upper course, the other section of the web may proceed along path 231 past the folders directly to reversing rod or bar 86' and returning to turning bar 229 and thence on path 232 to the folder, or when returning from the reversing roll 86' may proceed to the turning bar 233 and proceed along path 234 to the folder.

Fig. 18 discloses another arrangement

of turning bars for the reversing of a web in a lower course. As for example, the web may proceed along path 235 past the folders directly to reversing bar 86 and back to turning bar 227 and thence to the folder, or the web may proceed by path 236 to the turning bar 237 and away from the folders to the reversing bar 87' and returning by a path 238 directly to the folder, or this web may proceed by path 239 to the turning bar 227 and then away from the folders to the reversing bar 87 and returning by path 240 directly to the folder. The other web section may proceed by paths 215 and 216 to the turning bars 211 and 213 and then proceeding directly to the folder.

With reference to Figure 19 it will be seen that two sources of power at least may be used, which sources are indicated at 55. Any number of units may be connected through any one of these sources of power through the shaft shown in this Figure as extending to one side of the press, the units of the press being divisible into as many presses as there are sources of power.

Other arrangements may be effected, the above description being merely illustrative of the possibilities of the various combinations that are possible with this novel device. It will be apparent from the above that two or more web sections may be led from either or both ends through the reversing and turning mechanism for bringing the webs either in side-by-side relation or in parallel planes and with one or more of the webs reversed as to sides with respect to any other or all the others.

In the operation of the device, the units in the press may be used in any combination from one unit to any number within the total number of the press. In the event where a few units are used in one part of the press, it will not be necessary to permit the remainder of the press to be idle, but other units of the same press may be used in separate groups, or may even operate on different webs to bring the same webs to a single or more turning devices and folders. One or more turning devices may be arranged along the top of the press for receiving the webs from the various units, together with any number of slitting devices that may be required or desired in connection with the turning and reversing mechanisms located thereon. Likewise any number of folders may be moved along the side of the press and located in selected positions in co-operation with the turning bar arrangements. At each station is driving means for effecting driving connections with the movable means, such as the turning bar

arrangements, the slitting devices and the folders. These devices may be disconnected when it is desired to move them, from one station to another, and reconnected to the drive sections or branches at the newly selected station, for re-establishing the driving thereof from the common or main drive.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A printing press with a number of units and movable folding means for receiving the web acted on by the units, characterised by the fact that the web folding means are movable alongside the press for selectively receiving the web acted upon from any selected unit of the press.

2. A printing press, as set forth in claim 1, including means for securing the movable web receiving means in any selected position.

3. A printing press, as set forth in claim 1, with driving means, including also means for operatively connecting said selective web receiving means with the driving means.

4. A printing press, as set forth in claim 1, including a web turning arrangement movable along the press for receiving the web, and means for holding the web turning arrangement in any selected place.

5. A printing press, as set forth in claim 4, including in association with the driving means for the press means for driving the web turning arrangement in either of its positions of adjustment longitudinally of the press.

6. A printing press, as set forth in claim 5, including coupling means for operatively coupling the arrangement with the common driving means for the units at any selected place of operation.

7. A printing press as set forth in claim 4, including a series of driving connections arranged in a row, and means for operatively and selectively connecting the driving connections with the web turning arrangement at any selected operative position of the arrangement.

8. A printing press, as set forth in claims 1 and 4, including on the frame of the press a track and means for setting the web turning arrangement at any selected point of the track.

9. A printing press, as set forth in claims 4 and 8, including in association with the web turning arrangement a base adapted to rest on the track, and means for lowering the arrangement with its base to cause the same to rest on the track in the selectively determined

position for the arrangement.

10. A printing press, as set forth in claim 9, including in association with the web turning arrangement rollers by means of which the arrangement is movable along the track, including in association with the means for fixing the arrangement in a selectively determined position means for relieving the rollers of the weight of said arrangement.

11. A printing press, as set forth in claim 10, wherein the means for fixing the turning arrangement in selectively determined position include eccentrically mounted bearings for the rollers permitting the rollers to be raised from engagement with the track to relieve said rollers of the weight of the turning arrangement.

12. A printing press, as set forth in claim 4, including adjustable turning elements located at selected angles in the web turning arrangements for turning the webs to the side of the press either in parallel planes or in the same plane.

13. A printing press, as set forth in claim 4, in which the units are adapted to be operatively arranged in groups with any number of units in each group, including guide means movable along the press to any selected point for receiving webs proceeding from the group of units and for supplying the webs to the turning arrangement.

14. A printing press, as set forth in claim 1, including guide means for turning a web and leading it to the folding mechanism or for leading it past the folding mechanism or away from the folding mechanism for reversal and then back to the folding mechanism.

15. A printing press, as set forth in claim 14, including guide means adjustably located at any desired place along the series of units and in cooperation with said folding mechanism.

16. A printing press, as set forth in claim 14, including a common means for driving the printing units, the folding mechanism and the guide means.

17. A printing press, as set forth in claims 14 and 15, in which the guiding means include web turning mechanisms.

18. A printing press, as set forth in claim 5, including in association with the driving means for the units of the press and in association with the driving means for the turning arrangement means for effecting the reverse driving of the turning arrangement.

19. A printing press, as set forth in claims 14 and 15, including drive connections movable with the folding means and adapted to be selectively placed into drive relation to the drive elements of the

press when the folding means is in selected position.

20. A printing press, as set forth in claim 19, including driving means extending along the row of units and having a plurality of spaced drive sections, the folding arrangement being provided with drive means for operative selective connection to the drive sections, whereby the

15 folding arrangement may be driven and operated in any desired operative position. 21. A printing press, as set forth in claim 14, including guiding and web slitting means movable in selected relation to any units or group of units, the web turning arrangement being in cooperation with the guiding and slitting means, and the folding means being in cooperation with the web turning arrangement.

20 22. A printing press, as set forth in claims 10 and 21, wherein the guiding and slitting means are movable along the track of the frame of the press to any selected position thereon in operative relation with any selected unit or group of units while retaining the cooperative relation with the turning arrangement.

25 23. A printing press, as set forth in claims 18 to 21, including means for reversely driving the web turning arrangement, the web guiding and slitting means and the folding means.

30 24. A printing press, as set forth in claim 4, including in the web turning

arrangement a frame, supports carried by the frame for turning bars to hold the bars at selected different angular positions, and web feeding means mounted on the frame to move a web past and about the turning bars in any of their selected arrangements.

25. A printing press, as set forth in claim 21, including in association with the guiding and slitting means movable along the track means for lifting the slitting devices when they are to be shifted along the track and for lowering the slitting devices in any selected place on the track and for holding the slitting devices engaged with the track at selected points.

26. A printing press, as set forth in claim 1, including as driving means for the various printing units at least two sources of power, and means whereby any number of units may be connected with any source of power according to the number of units desired to form a press, the units being divisible into as many presses as there are sources of power.

27. A printing press, substantially as described and shown, and for the purpose set forth.

Dated this 2nd day of January, 1930.

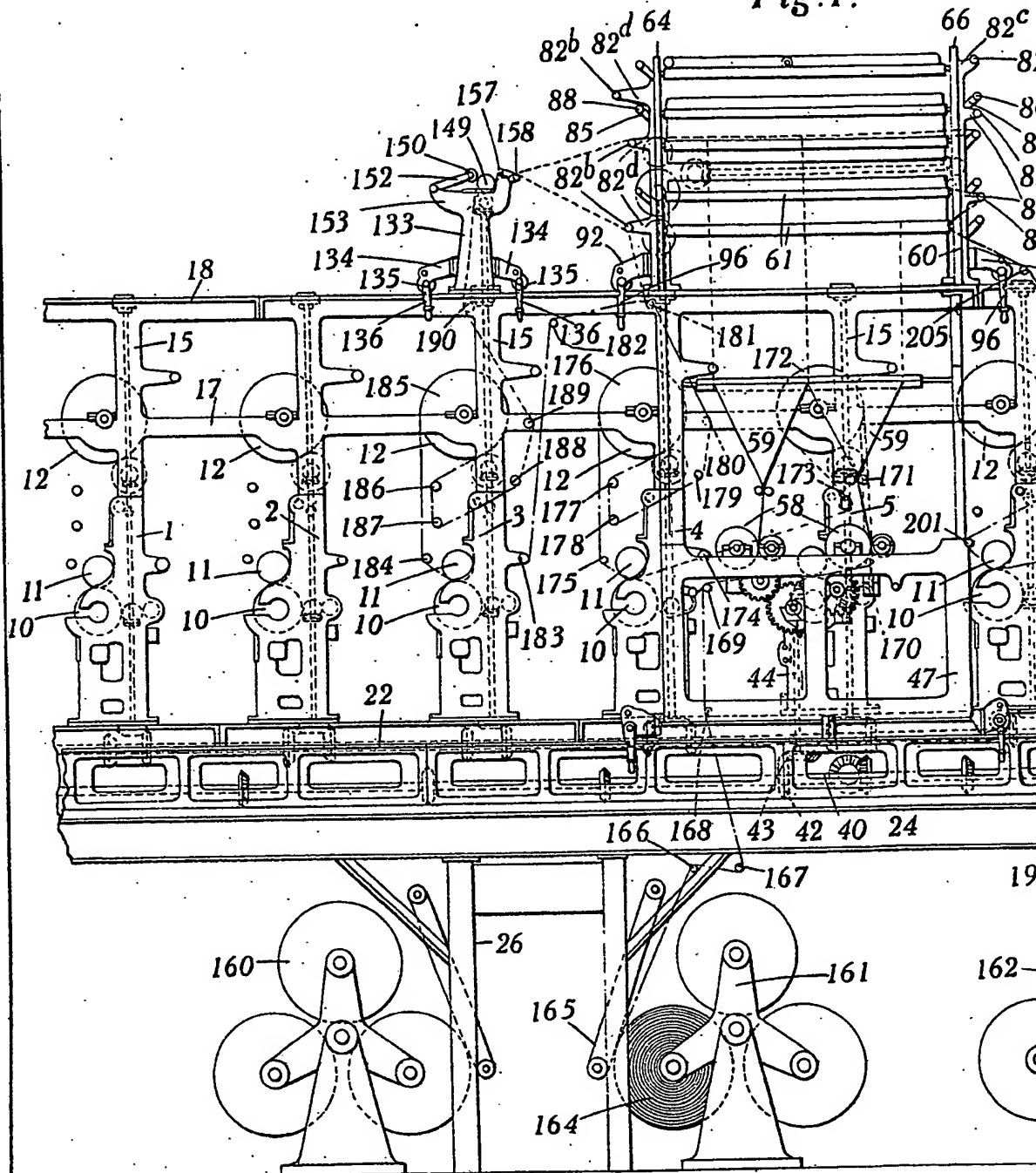
For the Applicant,

FRANK B. DEHN & Co.,

Chartered Patent Agents,

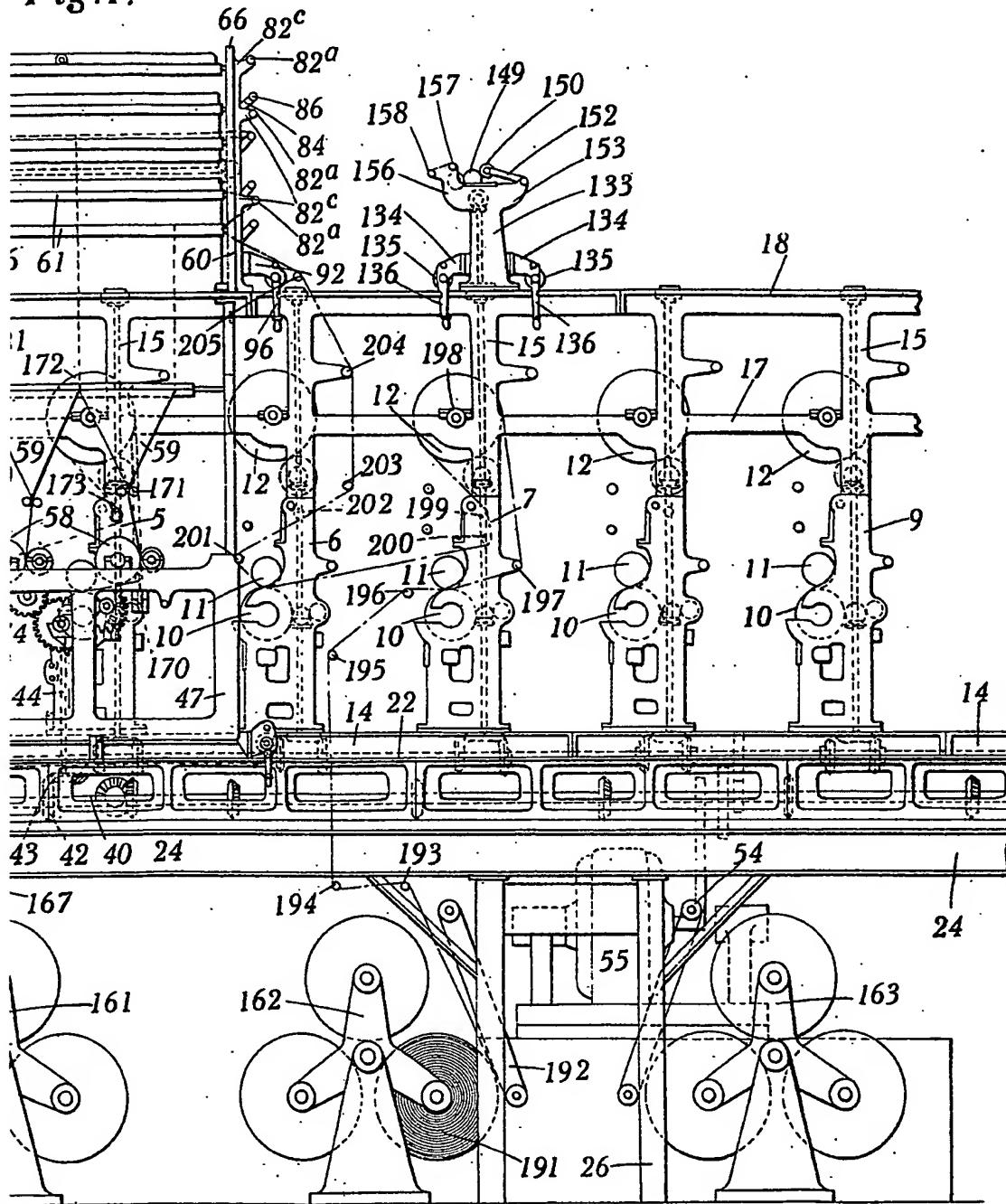
Kingsway House, 103, Kingsway, London, W.C.2.

Fig. 1.



[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.



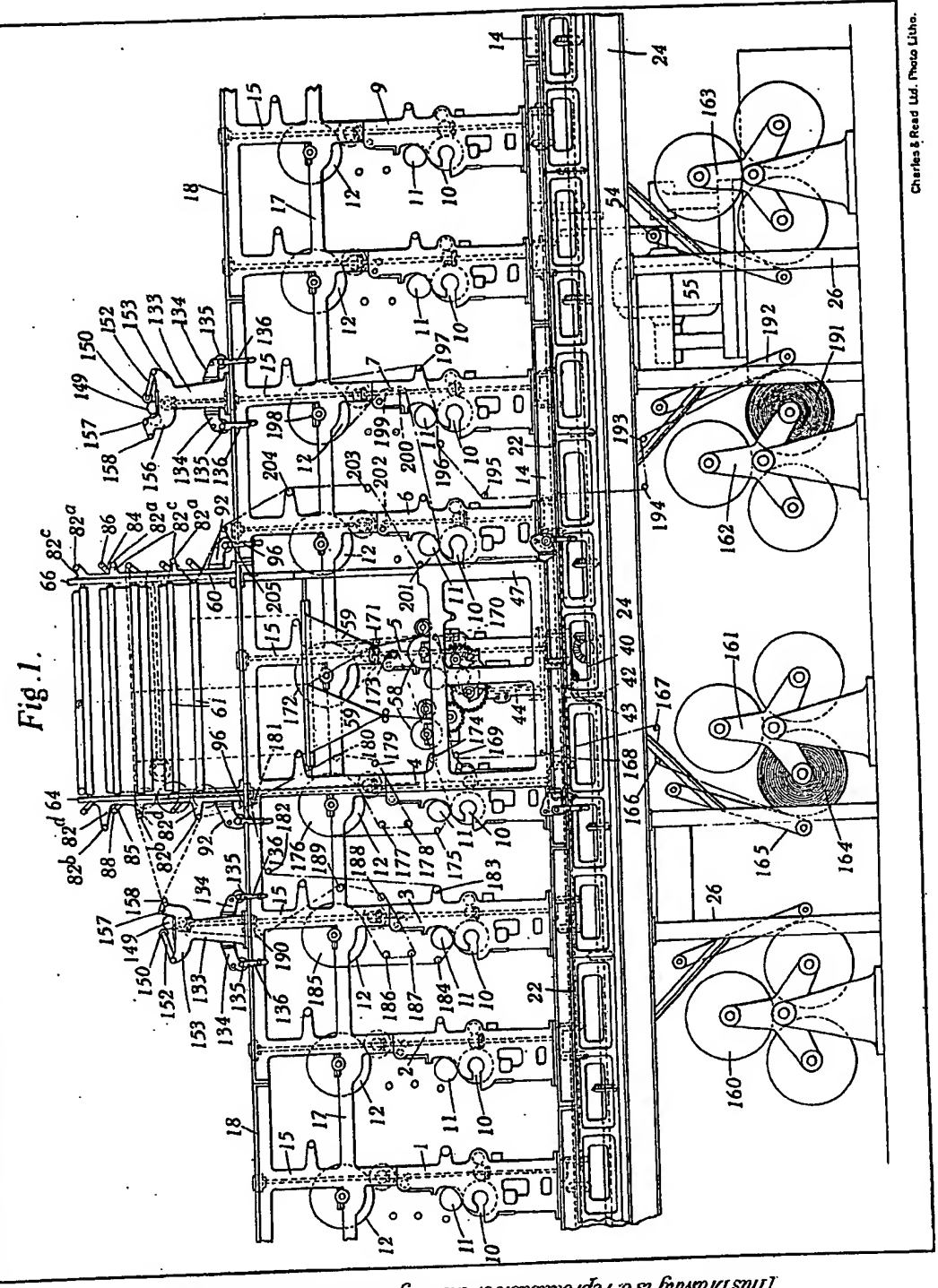
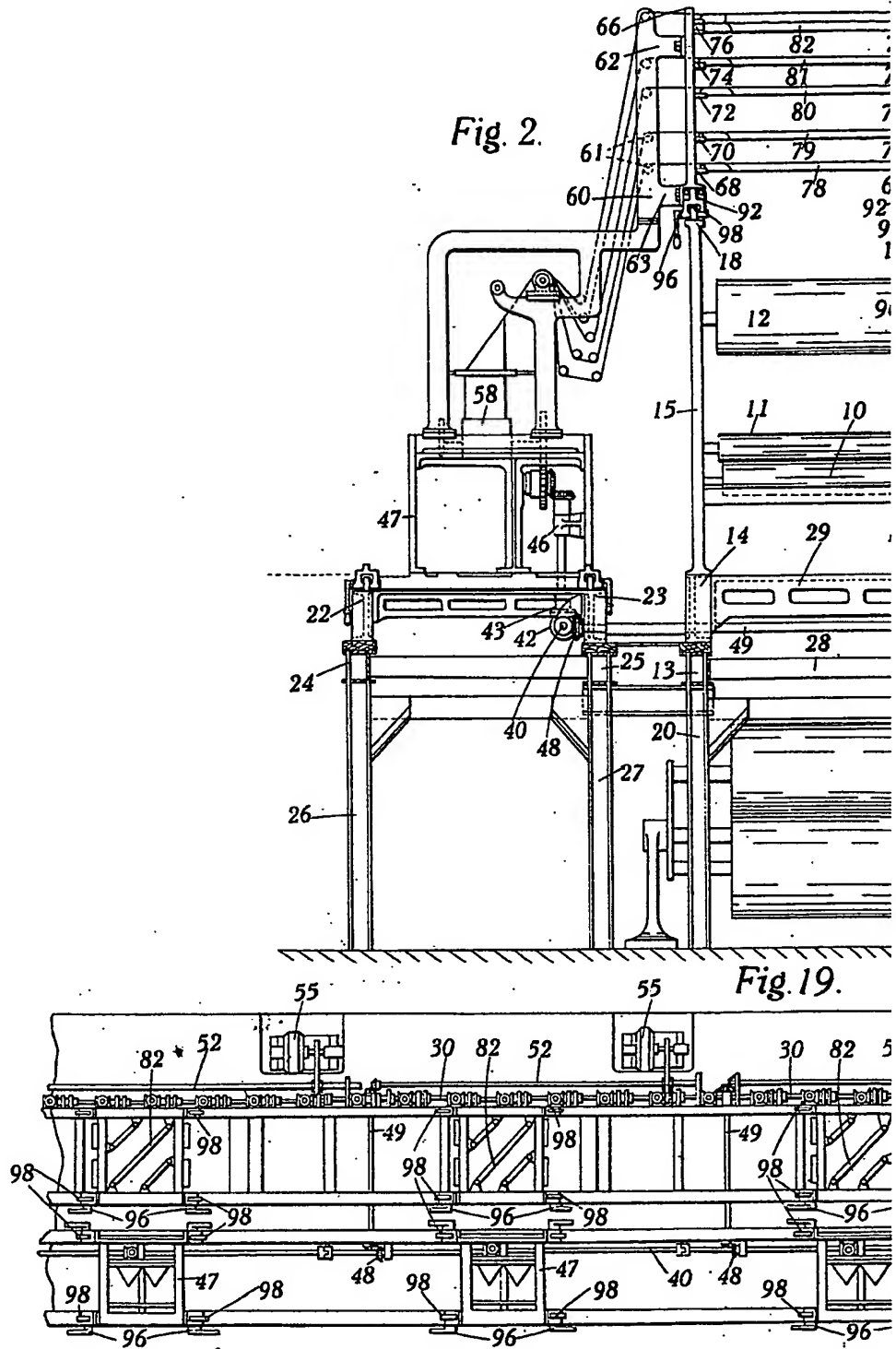


Fig. 1.

[This Drawing is a reproduction of the Original on a reduced scale]

[This Drawing is a reproduction of the Original on a reduced scale.]



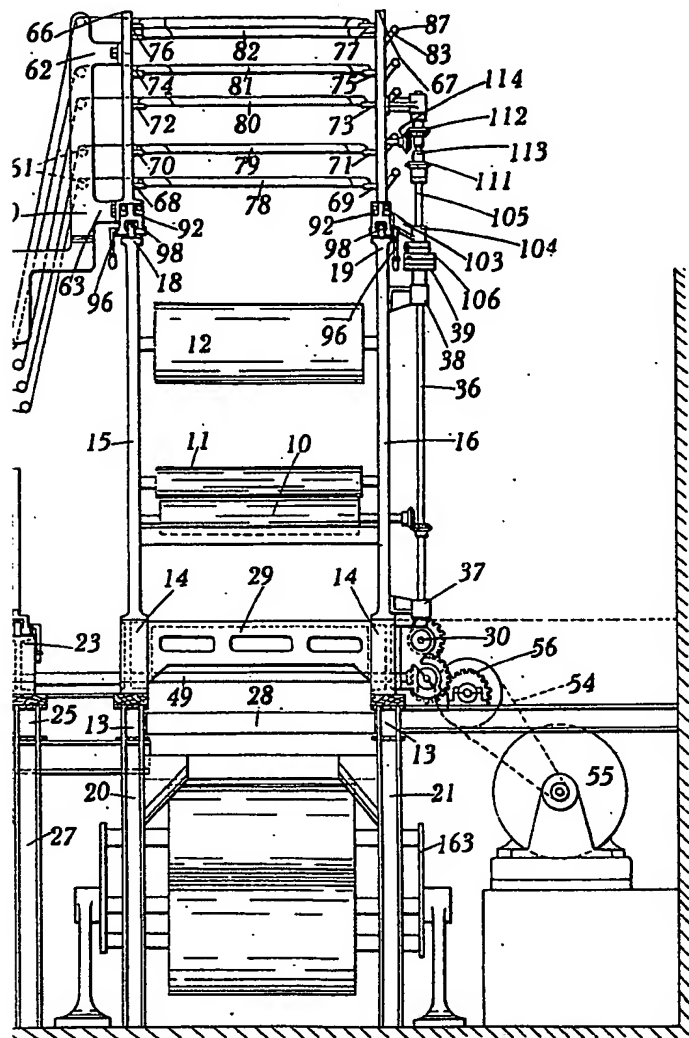
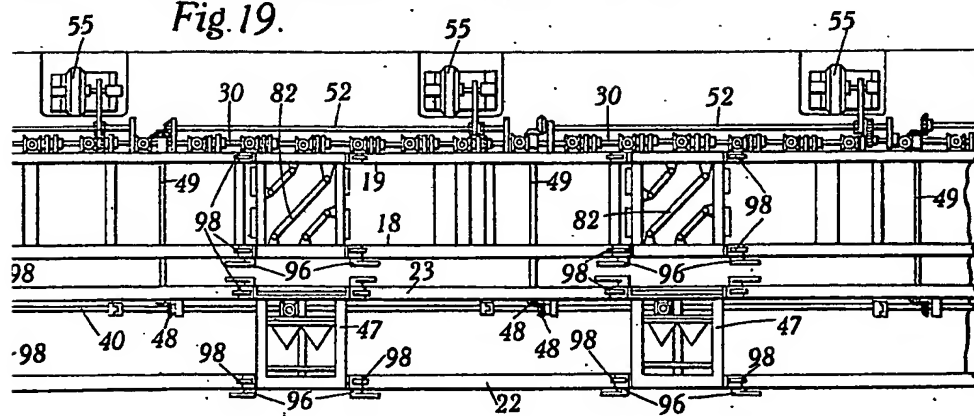


Fig. 19.



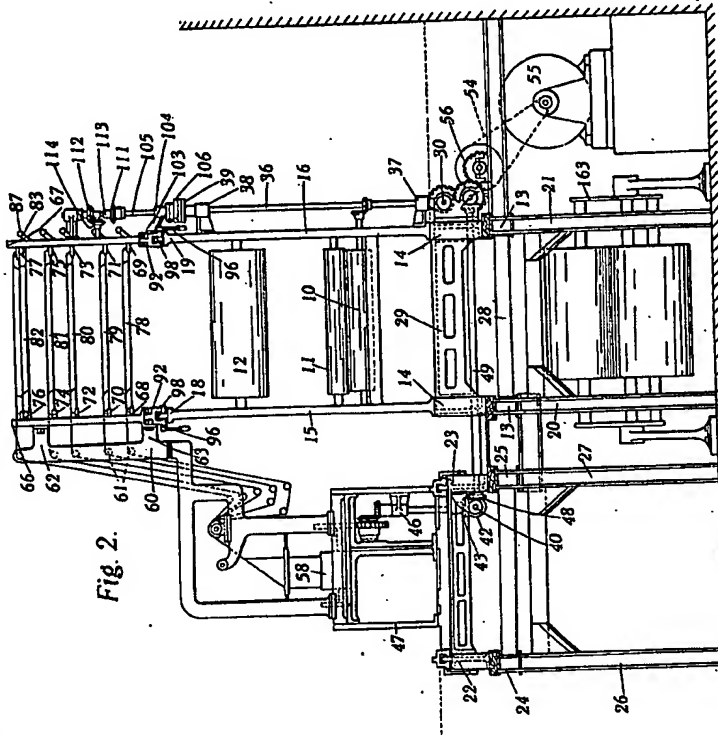


Fig. 2.

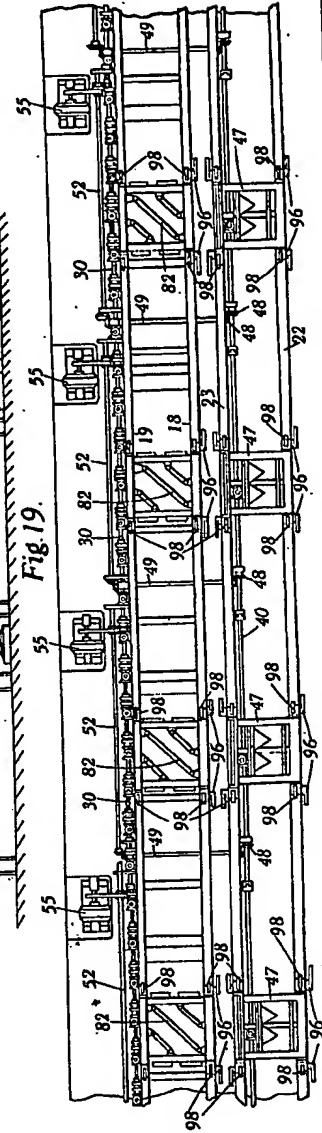


Fig. 19.

[This Drawing is a reproduction of the Original on a reduced scale]

Fig. 3.

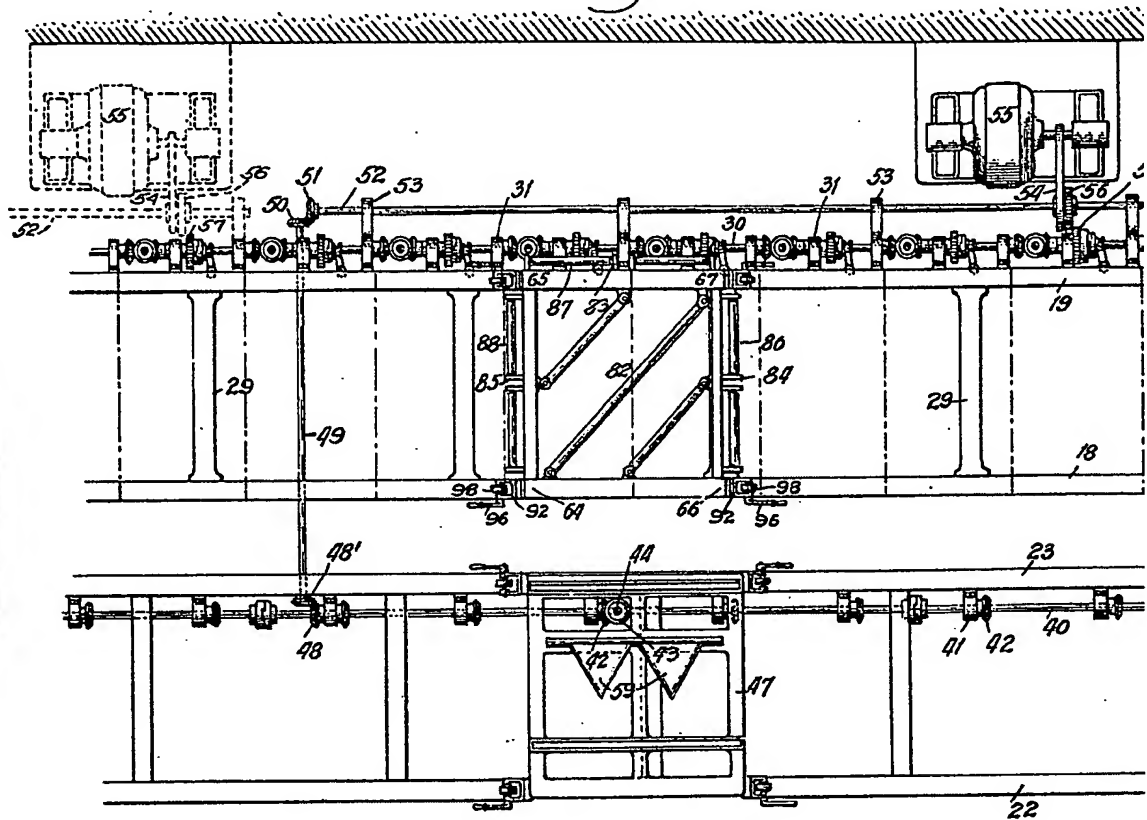
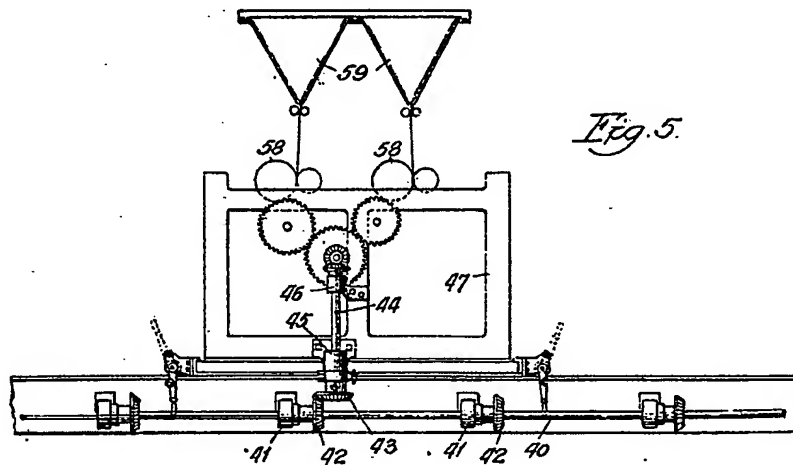
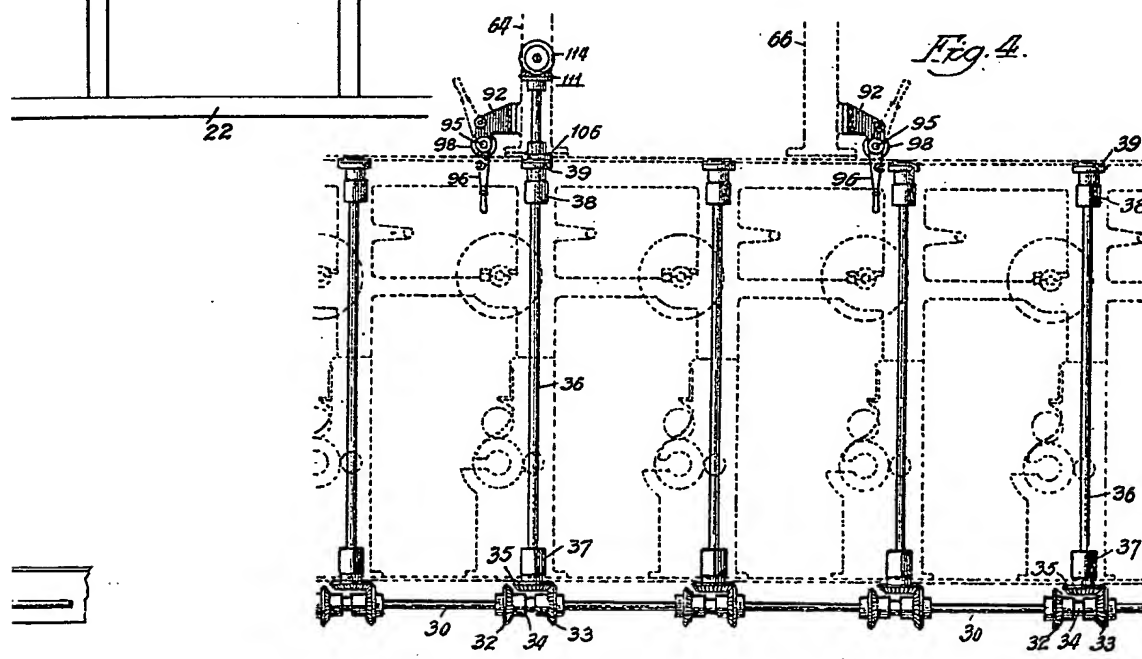
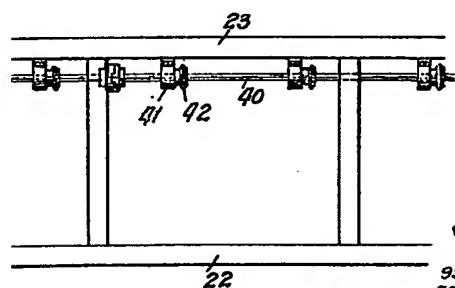
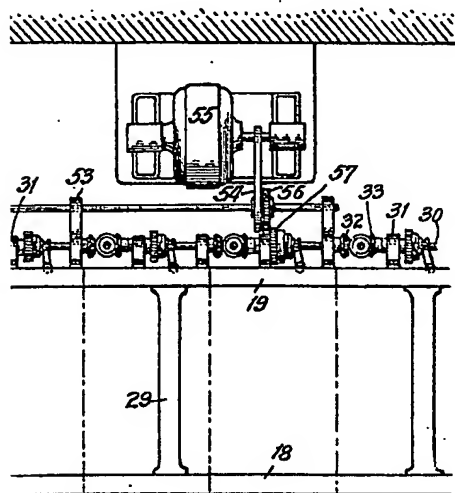


Fig. 5.



[This Drawing is a reproduction of the Original on a reduced scale.]



352,003 COMPLETE SPECIFICATION

Fig. 3.

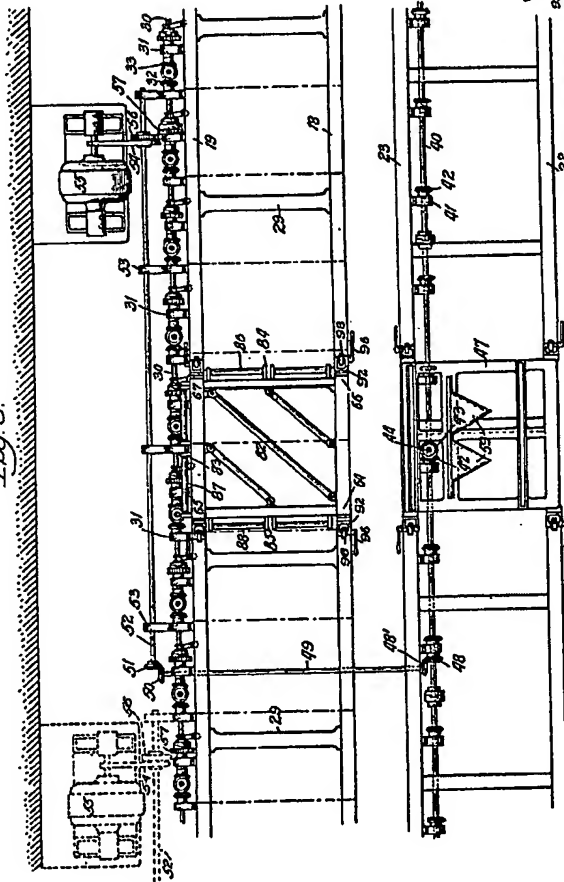


Fig. 4.

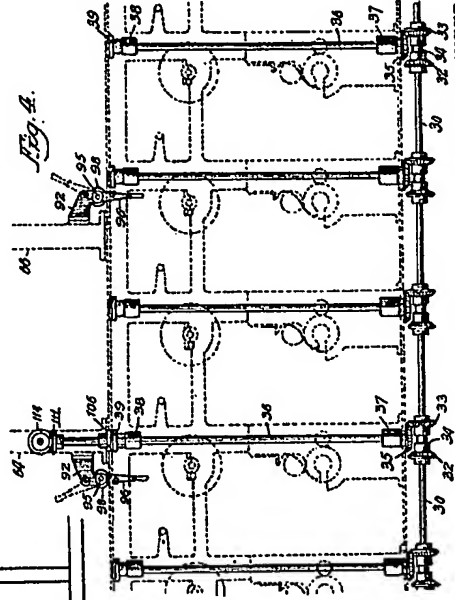
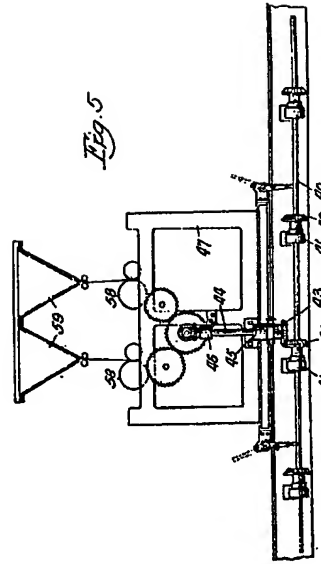


Fig. 5.



[This Drawing is a reproduction of the Original on a reduced scale]

Fig. 6.

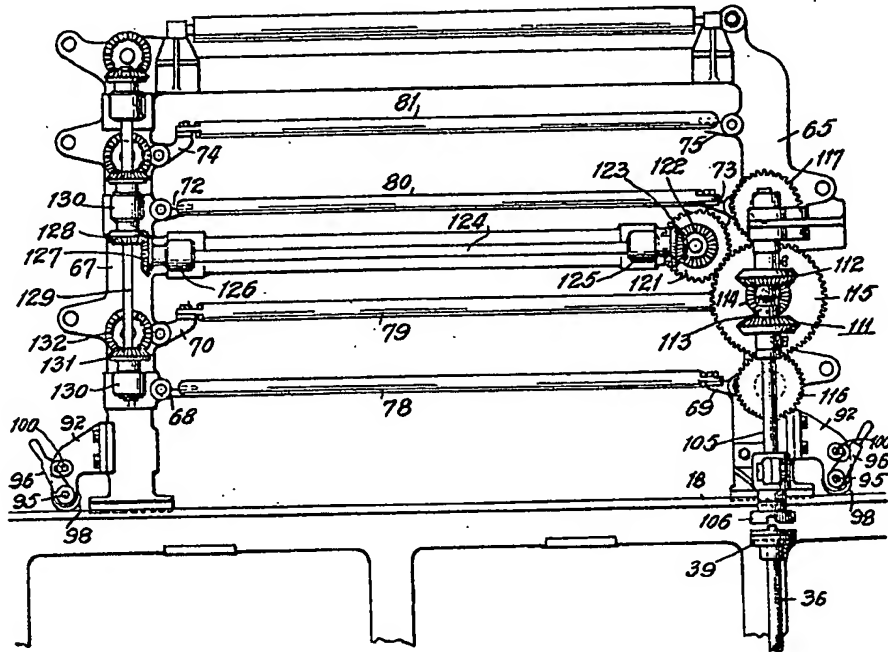
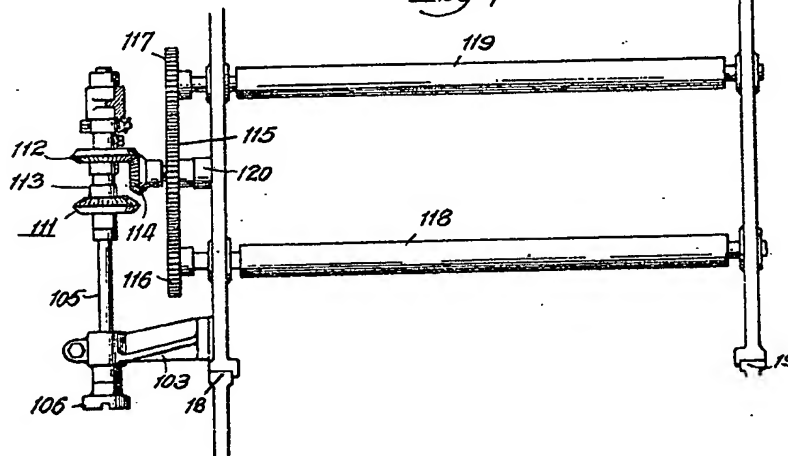
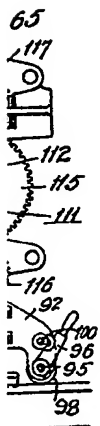


Fig. 7.



[This Drawing is a reproduction of the Original on a reduced scale.]





36

19

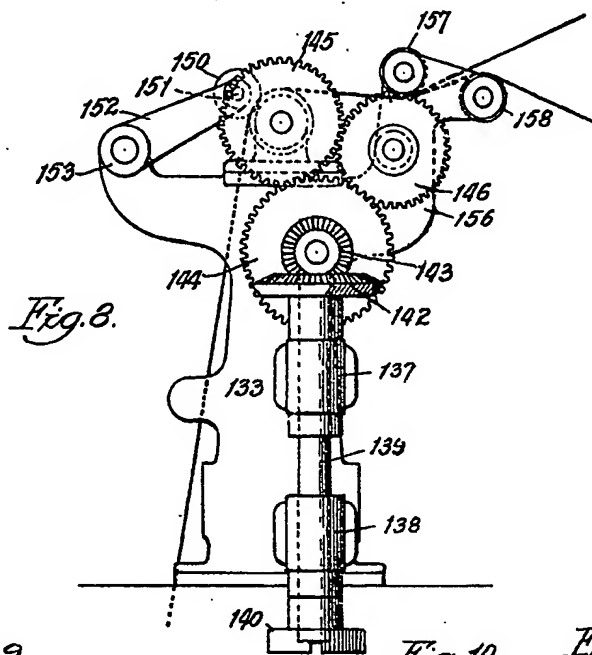


Fig. 9.

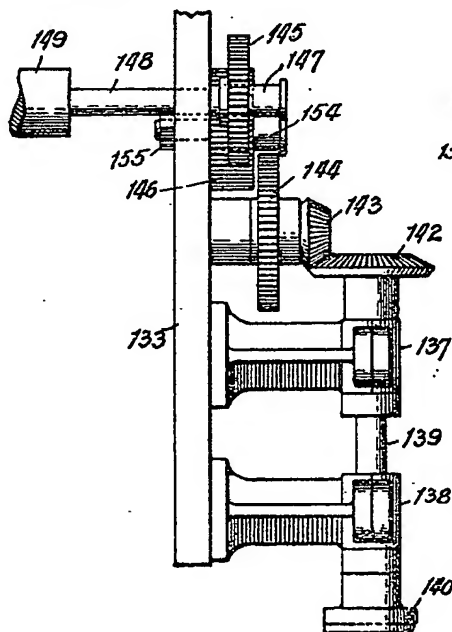


Fig. 10.

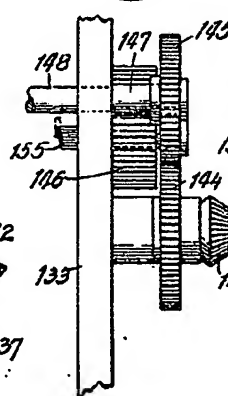
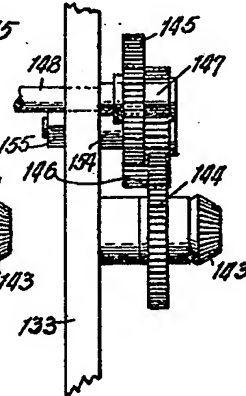


Fig. 11.



[This Drawing is a reproduction of the Original on a reduced scale]

Fig. 6.

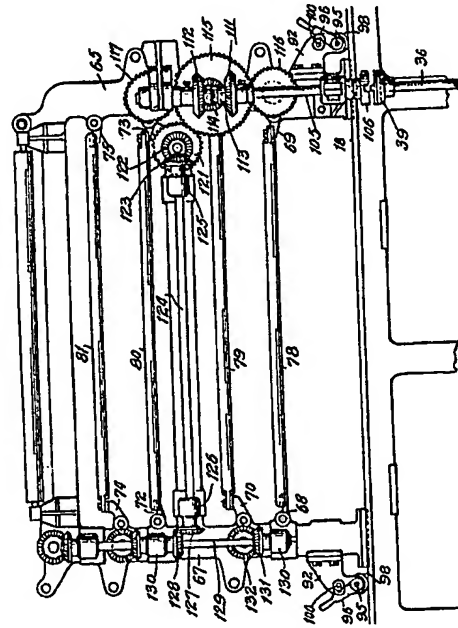
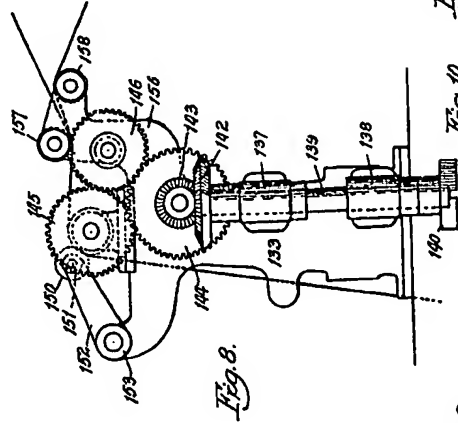
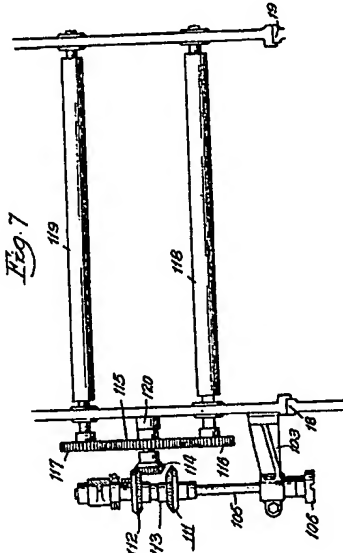


Fig. 7



[This Drawing is a reproduction of the Original on a reduced scale.]

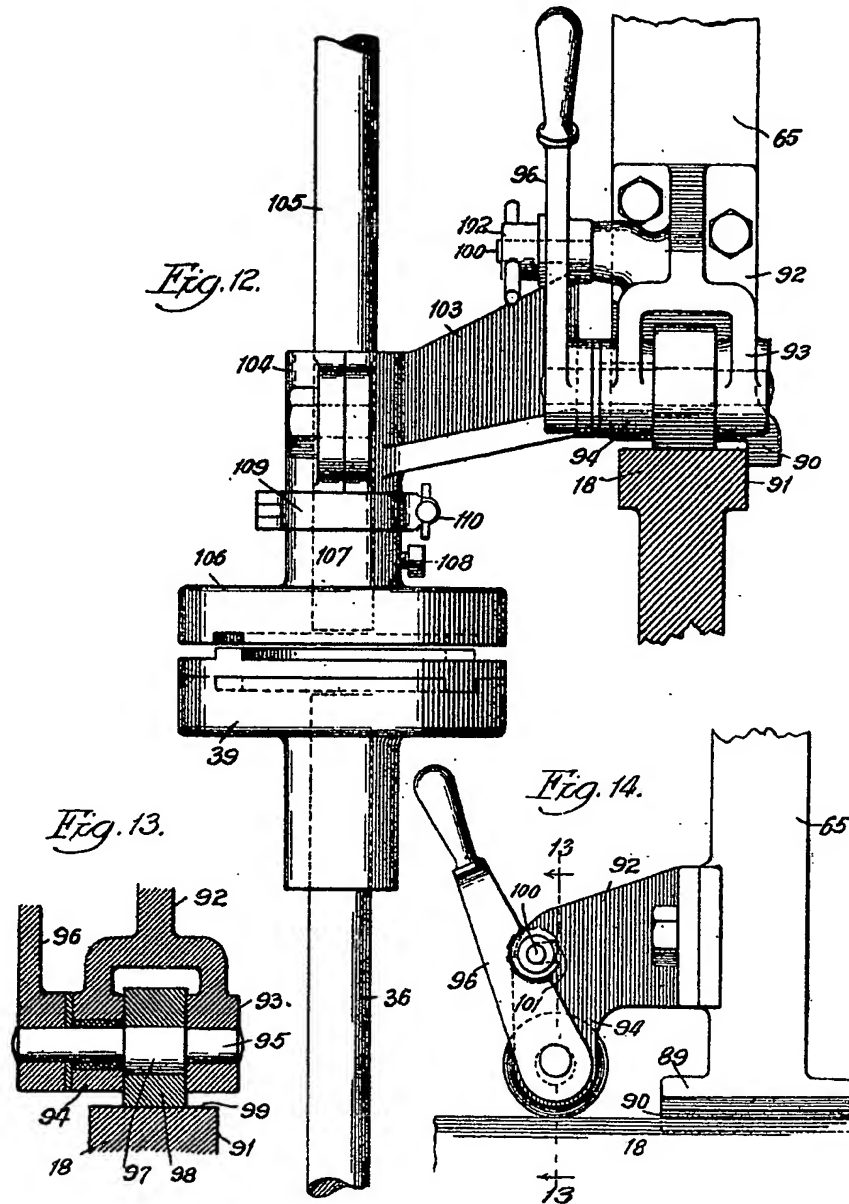


Fig. 15.

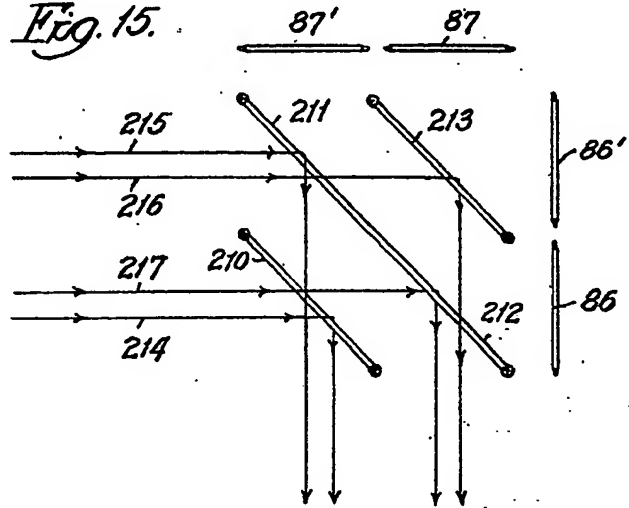


Fig. 1.

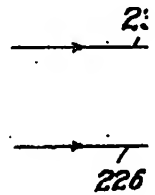
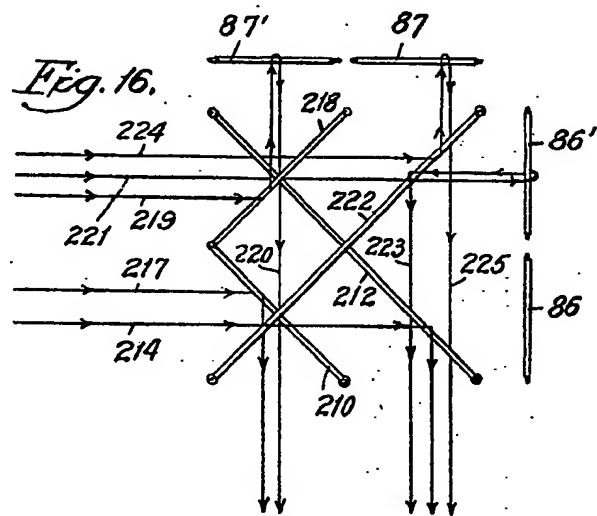


Fig. 16.



[This Drawing is a full-size reproduction of the Original.]

Fig. 17.

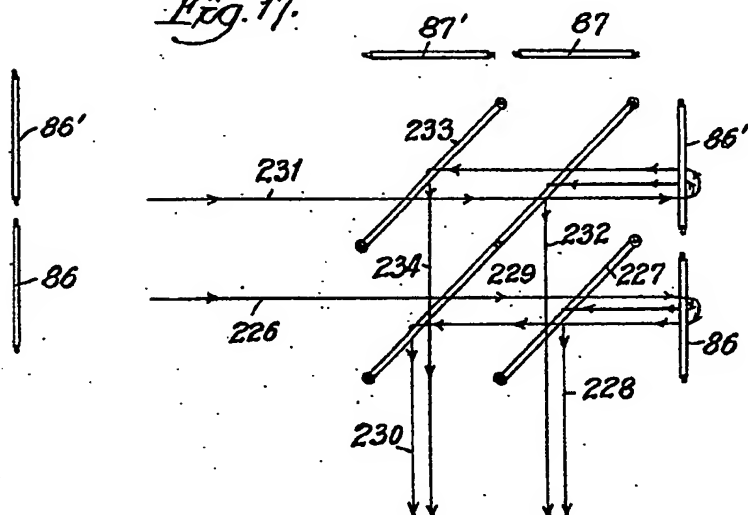


Fig. 18.

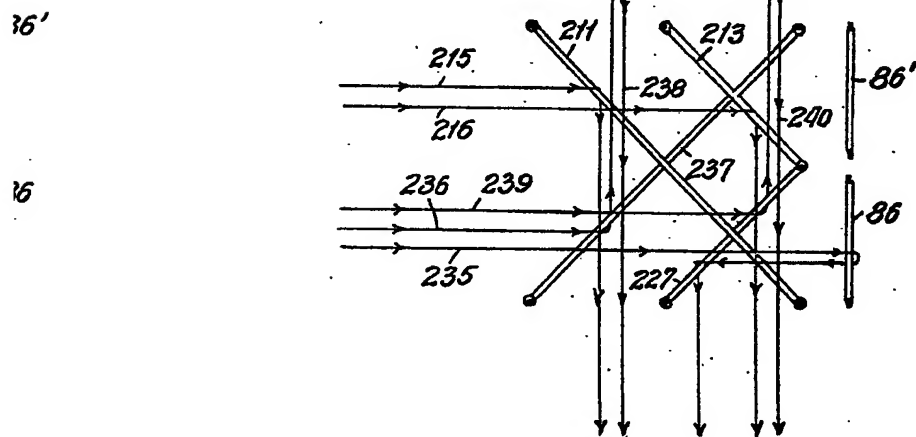


Fig. 15.

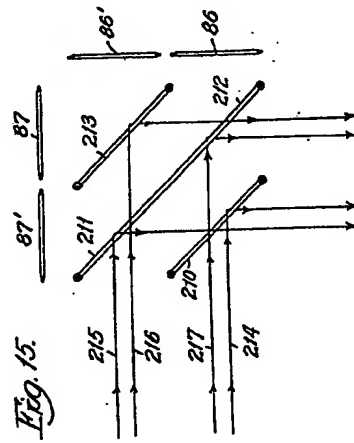


Fig. 17.

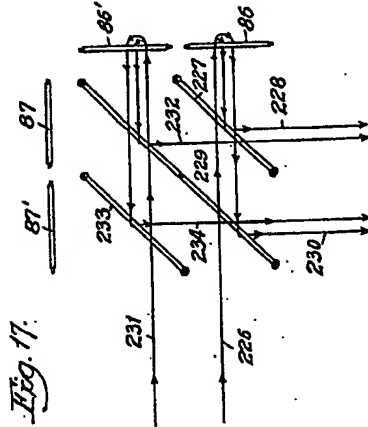


Fig. 16.

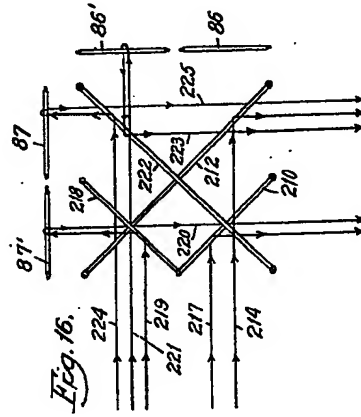
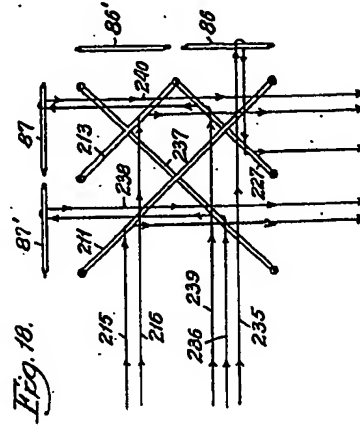


Fig. 18.



[This Drawing is a full-size reproduction of the Original]

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record.**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.